Release notes for ENDF/B Development n-050_Sn_122 evaluation

April 26, 2017

- `fizcon` Errors:
  1. A bad value in a data table is resulting in log(x) where x .le. 0.0
     MAT=5055, MF= 3, MT= 1 (1): Log(0) or worse

```
ERROR(S) FOUND IN MAT=5055, MF= 3, MT=  1
   NEG OR ZERO ARG OF LOG BELOW POINT    6          SEQUENCE NUMBER     3
```

  2. A bad value in a data table is resulting in log(x) where x .le. 0.0
     MAT=5055, MF= 3, MT= 2 (1): Log(0) or worse

```
ERROR(S) FOUND IN MAT=5055, MF= 3, MT=  2
   NEG OR ZERO ARG OF LOG BELOW POINT    5          SEQUENCE NUMBER     3
```

  3. A bad value in a data table is resulting in log(x) where x .le. 0.0
     MAT=5055, MF= 3, MT=102 (1): Log(0) or worse

```
ERROR(S) FOUND IN MAT=5055, MF= 3, MT=102
   NEG OR ZERO ARG OF LOG BELOW POINT    5          SEQUENCE NUMBER     3
```

- `psyche` Warnings:
  1. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 122. L = 0 / STRENGTH FUNCTION IS 1.28060E-05 / AVERAGE GAMMA WIDTH 3.40000E-02 / LIES OUTSIDE LIMITS 4.00000E-02 TO 9.00000E+00 EV. (0): URR str. ftn.

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 122. L =  0
                 STRENGTH FUNCTION IS  1.28060E-05
                              AVERAGE GAMMA WIDTH 3.40000E-02
... [1 more lines]
```

- `groupie` Errors:
  1. Very small elastic cross section found
     0: Small elastic

```
Multi-Group and Multi-Band Parameters from ENDF/B Data (GROUPIE 2015-2)
-------------------------------------------------------------------------------
ENDF/B Input and Output Data Filenames
ENDFB.IN
ENDFB.OUT
... [97 more lines]
```

- `fudge-4.0` Warnings:
  1. Missing a channel with a particular angular momenta combination
     resonances / resolved / MultiLevel_BreitWigner (Error # 0): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 0.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 1, J = 2.5 and S = 1.5 for "capture"
```

2. Potential scattering hasn't converted, you need more L's!
   resonances / resolved (Error # 1): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=1 at E=300000.0 eV, xs[1]/xs[0]=2.65309933416% > 0.1%
```

3. Cross section does not match sum of linked reaction cross sections
   crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.26%
```

4. Cross section does not match sum of linked reaction cross sections
   crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.10%
```

- `fudge-4.0` Errors:

1. Calculated and tabulated Q values disagree.
   reaction label 11: n[multiplicity:'2'] + Sn121 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -9029287.635925293 eV vs -8.8203e6 eV!
```

2. Calculated and tabulated Q values disagree.
   reaction label 12: n[multiplicity:'3'] + Sn120 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -15199608.28833008 eV vs -1.49964e7 eV!
```

3. Calculated and tabulated Q values disagree.
   reaction label 13: n + H1 + In121 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -11609953.07775879 eV vs -1.13976e7 eV!
```

4. Calculated and tabulated Q values disagree.
   reaction label 14: Sn123 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 5729745.088348389 eV vs 5946390. eV!
```

5. Calculated and tabulated Q values disagree.
   reaction label 15: n + He4 + Cd118 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5878405.076583862 eV vs -5660880. eV!
```

6. Calculated and tabulated Q values disagree.
   reaction label 16: H1 + In122_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5802341.303359985 eV vs -5563520. eV!
```

7. Calculated and tabulated Q values disagree.
   reaction label 17: H2 + In121_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -9385386.976821899 eV vs -9087510. eV!
```

8. Calculated and tabulated Q values disagree.
   reaction label 18: H3 + In120_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -11305462.44729614 eV vs -1.11205e7 eV!
```

9. Calculated and tabulated Q values disagree.
   reaction label 19: He4 + Cd119_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -608152.6565093994 eV vs -61786.3 eV!
```

- `njoy2012` Warnings:

1. Evaluation has no unresolved resonance parameters given
   unresr...calculation of unresolved resonance cross sections (0): No URR

```
 ---message from unresr---mat 5055 has no unresolved parameters
                          copy as is to nout
```

2. Evaluation has no unresolved resonance parameters given
   purr...probabalistic unresolved calculation (0): No URR

```
 ---message from purr---mat 5055 has no unresolved parameters
                          copy as is to nout
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 16
                          only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 17
                          only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 22
                          only mf4/mf5 provided
```

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 28
                          only mf4/mf5 provided
```

7. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 91
                          only mf4/mf5 provided
```